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Scheduled Time to Crimp Tubes. (woven Endo).

Attempted crimping with the following methods:

- Mechanic Crimping (Heated rolls)
- Circular Crimping (Hot water bath + shrink Tube)
- Spiral Crimping. (winding yarn on Te Tube, compressed, + Heat set).

Material used: { Woven Endoprosthesis Grafts 12 mm, flat filling yarns. Batch # 3.

Mechanical Crimping: (AD 000004). [Graft ID ≈ 13.5 mm]

Sample #	Roll speed set	Hache #	Roll Temp °F	Roll Pitch	Mandrell Size (mm) grooved.	Comments:
1	5	4	329-348 set - 330	12 ppi	11 mm	Fabric wrinkles as it turns causing wrinkle setting as it goes through the rollers.
2 A	10	7	325-328 (325 set)	12 ppi	14 mm	same problem, Tried Temp. set at 300°F, shows no improvement
2 B	10	7	315	12 ppi	10 mm	Fabric wrinkle were worst.

Circular Crimping: (AD 000003) [Hot bath + shrink Tube]
Graft I.D. ≈ 13.5 mm

Sample # 3

* Inverted sample on groved mandral, mandrel size = 12 mm, sumerged sample with shrink tube + groved mandrel into Hot water tank at 190° ± 10°F for 2.5'. Cooled in cold wate for 1.5'

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Radular Crimping cont. The sample did not crimp at all. This method is mostly for knitted.

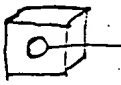
Spiral Crimping: (AD 000002).

Sample #4 Graft I.D. ≈ 13.5 mm.

Used The laid to wind on yarn at X turns per inch on To graft placed on a steel mandrel.

Graft I.D. = 13.5 mm
Mandrel O.D. = 12 mm (straight).
yarn wound = 840 denier Nylon.

- Nylon was wrapped at 10 tpi on To Sample
- Sample wound was completely compressed using perforated block



- Once sample was compressed was placed in Autoclave. 250 °f. Total of 6-7 min. (Regular fast cycle)
- Sample Removed from mandrel and stretched.
- in Autoclave for an Elongation cycle. (AD000005) (1' at 250° ± 5°f, 15.13 psi, All steam removed and 3' Dry cycle).

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With The Spiral crimping The sample crimped but There was a folded edge because The graft I.D. was Too big (13.5 mm) compare To The mandrel 12 mm (straight).

To solve The problem above mentioned will Shrink To fit The Tubes with Dry heat for better fit on The mandrel, so To eliminate The folding on one side.

The Shrink To fit is done AS AD.000043 but without compressing The graft. This is done using A Dry Heat oven and using Teflon mandrels. The graft is placed on To The Teflon mandrel, and (steel) clips are placed To hold The sample straight. The oven is heated To 175 ± 5 °C, The samples are placed in The oven for 15' AT 175°C, Then removed. Now samples are ready for crimping.

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HEAT SET ON ~~DRY HEAT OVEN~~

(Using teflon mandrels, done to shrink to fit woven tubes. So to fit on steel mandrel for Spiral Crimping).

SHRINK TO FIT (on dry heat oven):

	Sample #	Length (cm) Before	Length (cm) After	I.D. (mm) Before	I.D. (mm) After	Oven Temp. (F) C	Time (min)	Mandre Size (mm)	Comments:
3/29	5		56	13.5	12.5	175°	15'	12	Teflon mandrel - Both tubes shrunk evenly eliminating wrinkles after folding - Tube edges still frayed
3/29	6		56.5	12.5	12.0	175°	15'	12	
4/13	9		5	13.5	12.5	175°	15'	12.0	Steel mandrels
4/13	10		5.24	13.5	12.5	175°	15'	12.5	

Aorta Steel mandrel.

SPIRAL CRIMPING:

	Sample #	Compacted Length (cm) Before	Compacted Length (cm) After	I.D. (mm) Before	I.D. (mm) After	A-clave Temp. (F)	Time (min)	Mandre Size (mm)	Windings (TPI)	Comments: (Steel mandrel)
4/12	5			~~12.0~~ 12.5	12.5	250°	1' Steam 2' dry	12	8	Some wrinkles
4/13	6			12.0	12.6	250	1' ST 2' dry	12	8	better (less wrinkles)
4/13	9			12.5	12.5	250	1' ST 2' dry	12	8	
4/13	10			12.5	12.5	250	1' ST 2' dry	12	8	

JN

ELONGATION CYCLE:

	Sample #	Length (cm) Before	Length (cm) After	I.D. (mm) Before	I.D. (mm) After	A-clave Temp. (F)	Time (min)	Comments: Clamped on steel mandrel.
4/12	5			12.5	12.5	250	0 ST. 2 dry	
4/13	6			12.6	12.6	250	0 ST 2 dry	
4/13	9			12.5	12.5	250	0 ST 2 dry	
4/13	10			12.5	12.5	250	0 ST 2 dry	

Endopros/93072

Sample #6 Sent to Dr. Chuter ST = Steam cycle
Rochester Gen. Hospital, N.Y. dry = dry cycle.
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HEAT SET ON ~~AUTOCLAVE STEAM OVEN~~

(Using steel mandrels, done to shrink to fit woven tubes. So to fit on steel mandrel for Spiral Crimping).

SHRINK TO FIT (on Autoclave oven):

Sample #	Length (cm) Before	Length (cm) After	I.D. (mm) Before	I.D. (mm) After	Oven Temp. (F)	Time (min)	Mandre Size (mm)	Comments:
4/12 7	50.1	50.3	13.5		250	1 ST 2 dry	12	Steel mandrel
8	58	58	13.5		250	1 ST 2 dry	12	

SPIRAL CRIMPING:

Sample #	Compacted Length (cm) Before	Compacted Length (cm) After	I.D. (mm) Before	I.D. (mm) After	A-clave Temp. (F)	Time (min)	Mandre Size (mm)	Windings (TPI)	Comments:
4/12 7	2.5"	14"	12.5	12.5	250°	1 ST 2 dry	12	8	Steel mandrel.
8			12.5	12.5	250°	1 ST 2 dry	12	8	

JN.

ELONGATION CYCLE:

Sample #	Length (cm) Before	Length (cm) After	I.D. (mm) Before	I.D. (mm) After	A-clave Temp. (F)	Time (min)	Comments:
4/12 7	14	13 3/16"			250°	0 ST 2 dry	on 12 mm Steel
8					250°	0 ST 2 dry	mandrels.

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ST = Steam Cycle
dry = dry cycle.

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